Log Event A

Borehole # 20-09-06

Borehole Information

Farm : B	**Tank :** B-109	**Site Number :** 299-E33-198
N-Coord : 45,394	**W-Coord :** 52,748	**TOC Elevation :** 652.71
Water Level, ft :	**Date Drilled :** 2/28/1972	

Casing Record

Type : Steel-welded	Thickness : 0.280	ID, in. : 6
Top Depth, ft. : 0	Bottom Depth, ft. : 100	

Borehole Notes:

Borehole 20-09-06 was drilled in February 1972 to a depth of 100 ft and was completed with 6-in. casing. Data from the drilling log and Chamness and Merz (1993) were used to provide borehole construction information. These references do not indicate that the borehole casing was perforated or grouted. The casing thickness is presumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. steel tubing.

Equipment Information

Logging System : 1B	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 02/1997	**Calibration Reference :** GJO-HAN-14	**Logging Procedure :** P-GJPO-1783

Logging Information

Log Run Number : 1	**Log Run Date :** 09/18/1997	**Logging Engineer:** Bob Spatz
Start Depth, ft.: 0.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 18.0	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

Log Run Number : 2	**Log Run Date :** 09/19/1997	**Logging Engineer:** Bob Spatz
Start Depth, ft.: 101.5	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 17.0	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

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Logging Operation Notes:

This borehole was logged by the SGLS in two log runs. The top of the borehole casing, which is the zero reference for the SGLS, is located in a berm approximately 3.5 ft above the ground surface. The total logging depth achieved by the SGLS was 101.5 ft.

Analysis Information

Analyst : P.D. Henwood

Data Processing Reference : MAC-VZCP 1.7.9 Analysis Date : 03/22/1999

Analysis Notes :

The pre-survey and post-survey field verification for the logging runs met the acceptance criteria established for peak shape and system efficiency. The energy calibration and peak-shape calibration from the accepted calibration spectrum that most closely matched the field data were used to establish the peak resolution and channel-to-energy parameters used in processing the spectra acquired during the logging operation.

A casing correction factor for a 0.280-in.-thick steel casing was applied to the concentration data during the analysis process.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots indicate the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

Results/Interpretations:

The man-made radionuclides Cs-137 and Co-60 were detected around this borehole. The Cs-137 contamination was detected almost continuously from the ground surface to a depth of about 14.5 ft. The measured concentrations were all less than 2 pCi/g, with the maximum concentration of about 1.5 pCi/g occurring at a depth of 3.5 ft.

Co-60 contamination was detected from 73 to 88 ft. The measured concentrations were all below 0.2 pCi/g.

The K-40 concentrations increase at about 40 ft, representing the transition from the backfill material to the undisturbed Hanford formation sediments.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Reports for tanks B-108 and B-109.